UNIVERSITY OF WASHINGTON

ARBORETUM BULLETIN

Published Quarterly by the Arboretum Foundation

WINTER, 1975

WHAT IS AN ARBORETUM?*

"What is an Arboretum?" . . . To children an arboretum is a place of adventure; something new, something wide open, with large trees and plants. The ladies go there to see the many beautiful plants; . . . to get ideas and try to emulate in their home garden the things they see at the arboretum. To the husbands, it is a place where wives go to get ideas to keep the husband busy on a Sunday afternoon when he wants to watch football or baseball.

To people who don't like plants, it means higher taxes. To horticultural organizations, it is a place to meet and to support the goals of their organization. To a budget analyst, it is a place where he can look good by finding ways to cut expenditures, and if he cuts enough he might get a promotion. And to a few politicians, it means many different things and even more so if valuable votes can be obtained . . . .

To the botanist, to the taxonomist, to the plant physiologist, to the geneticist, the people involved in education and public services, it all means different things. They put their emphasis on their particular interest, and they come up with a different answer as to where an arboretum should go and what an arboretum should do. Then it comes down to the administrator and to the director to try and put this whole thing together as to what an arboretum is going to do.

Basically an arboretum, to most people, is a place where you collect plants; woody plants and trees. An arboretum is a place where money is very essential for its continued development and maintenance. An arboretum is always developing. It never stops developing. Financial support is necessary for the programs that go along with the plant collections. . . . With inadequate funds, an arboretum can survive for only a very limited time because the funds are stretched and stretched until the arboretum can no longer function properly. . . . An arboretum is a place in which both public and private support is necessary for its existence. . . .

An arboretum is a place where growth and performance records are kept. It is a repository, a museum of plants, living and dead, past, present and future. . . . Most of all, the arboretum must be viable. . . . The arboretum must be dynamic, offering programs, new programs and repeat programs, to share the knowledge that we have accumulated with the taxpayers that support the arboretum.

FRANCIS CHING, Director
Los Angeles State and County Arboretum

*Excerpts from the "Proceedings of a Symposium: The Urban Arboretum in a Time of Crisis," sponsored and published by the Arboretum Foundation, June, 1972 at the University of Washington.

THE ARBORETUM BULLETIN

Vol. XXXVIII, No. 1
Seattle, Wa., Winter, 1975

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THE UNIVERSITY OF WASHINGTON
Arboretum bulletin

VOLUME XXXVIII, NUMBER 1
Winter, 1975

TABLE OF CONTENTS

What is an Arboretum ..... Francis Ching — Inside Front Cover
The Pitfalls and Pinnacles of Being Tiny: Dwarf Trees ..... Raymond P. Guries — 2
Try It!! It's Easy!! ..... Betty and Jim Caperci — 6
Dwarf Conifers in the Arboretum, Washington Park ..... Brian O. Mulligan — 7
The Proposed Union Bay Arboretum ..... J. A. Witt — 10
Dwarf Conifer Collections 13
Portraits of Some Pygmies 14-15
Arboretum Classes 16
New Members 16
Phyllis Purdy Ballard ..... Rosamond P. Engle — 17
Ruth Dowell Svihla ..... Ruth H. Gershevsky — 17
Favorites — *Hamamelis mollis* ..... Elizabeth Marshall — 18
Arboretum Spotlight — *Camellia reticulata* .. Brian O. Mulligan — 19
The Shotgun Approach to Hybridizing ..... Gwen Bell — 20
Unit Conversations 23
Book Reviews 25

COVER PHOTO

Camellia reticulata

Flowering on north side of office building at Arboretum, Seattle. Flowers 4 ins. wide when fully open; rich rose pink in color. (see p. 19) Photo: B. O. Mulligan

"Witch's broom" at base of tree of *Pinus contorta* var. *latifolia*, growing three inches above the ground. By trail up E. Fork of Bitterroot River, Ravalli Co., W. Montana. Photo: B. O. Mulligan.

The Pitfalls and Pinnacles of Being Tiny: Dwarf Trees

*RAYMOND P. GURIES**

Like pieces of modernistic sculpture, trees come in a diversity of shapes and sizes, some large, some small, some globose, conical, cylindrical, or any of a number of combinations of form and habit. Most of this diversity is adaptive in that certain morphological traits, such as the overall shape of the crown, or the arrangement of leaves in a canopy, are extremely important to the competitive ability and, thus, the survival of the plant. The spire-like crown of subalpine fir, for instance, is apparently an adaptation for distributing and shedding heavy snows, while the spreading, multi-layered leaf arrangement of red alder is an efficient strategy for utilizing sunlight to maximum advantage in open roadside and forest situations created by fire, logging, and flood.

Occasionally, however, some of this diversity seems to be non-adaptive, as in the case of dwarf forms occurring in what are normally large tree species. Most of these dwarf forms are probably the result of relatively rare

*Mr. Guries is a doctoral candidate in the College of Forest Resources at the University of Washington.

events, mutations, which dramatically alter the normal growth pattern. The fact that most of the thousand-odd dwarf conifer forms in cultivation today were discovered as seedlings in nurseries, or collected from "witches' brooms" or "sports" on otherwise normal trees, suggests that dwarf forms are usually eliminated in nature by more competitive neighbors. For a tree whose apparent strategy in life is to grow tall, perhaps quickly, and monopolize a large share of the available sunlight, the mutant dwarf character apparently confers no advantage. Or does it? To examine this question critically, we need a little more information. We need to know something about the process responsible for creating dwarfs, its significance, and the way in which it alters the physiology of the plant. Furthermore, we can consider whether there are instances where dwarfism can be adaptive, although the prospect may at first seem remote.

The Mutation Process

Nobel Laureate Jacques Monod describes mutations as being drawn out of the realm of pure change, "the initial elementary events which open the way to evolution . . . microscopic, fortuitous, and utterly without relation to whatever may be their effect." Most contemporary biologists would agree that Monod succinctly captures the essence of mutation, for it is by random accidents or mistakes in the normally conservative process of replicating genes that the "raw material" of evolution is created. Brought about by a number of natural (and, increasingly, man-made) chemical and physical causes, changes in the genes of an organism occur at low but detectable levels. In trees, for instance, albino, variegated, and corkscrew forms are known to occur in a number of species. The rate of mutation is low but can be increased in many organisms by such agents as irradiation or specific chemicals. However, no method has yet been developed whereby man can direct the mutation process towards the creation of specific forms. This failing, while disappointing to those who would view directed mutation as an efficient and desirable tool in plant and animal breeding, is the source of considerable relief to numerous biologists who perceive the awesome power such a technique would give to those who ultimately could direct mutation. In the meantime, the mutation process, like a rebellious youth, continually generates change, unmindful of the controversy surrounding its use. As the elemental source of all genetic variation, mutation is the biological answer to coping with the unpredictable. In a world that is as capricious as it is complex, the mutation process is a mechanism which provides living organisms with the requisite variation to adapt to new and different circumstances. Just which mutations will be retained is the purview of natural selection, constantly filtering newly arising mutations, testing them for compatibility with an already highly adapted organism and the environment surrounding it. Although individual mutations are usually harmful, the mutation process as such may be viewed as beneficial, in fact essential, to the long-term survival of species in a changing world.

"Witch's broom" on old tree of mountain hemlock *(Tsuga mertensiana)* at Shoe Lake, Yakima Co., Washington. Approximate size, 10 ft. tall, 8 ft. wide. Photo: B. O. Mulligan

Dwarf mutants

Now, what of specific dwarf mutants, what do we know about their genetics and physiology? In the case of dwarf conifers the answer is easy, although hardly satisfying; very little. Dwarf conifers are a rather uncommunicative lot, a fact which does not aid the scientific dialogue between man and nature. Few dwarf conifers ever produce cones, an essential requirement for breeding studies aimed at determining the inheritance of the dwarf character. In the few cases where cones have been produced, researchers have determined that dwarfism in conifers is apparently the result of a single recessive gene. The term recessive merely indicates that this particular gene may be "hidden" in an individual when it occurs together with a normal gene. Thus, only when a seedling inherits the same dwarf gene from both its father and its mother does it develop as a dwarf. Beyond this, our knowledge of the factors responsible for dwarfism in conifers is scanty.

Investigation of dwarfism in agricultural crops such as peas, wheat, corn, tomatoes and others has been more successful for several reasons. Such plants are easier to propagate, usually do flower and set fruit, and are of considerable economic interest as witnessed by the development of high-yielding semi-dwarf wheat and dwarf rice varieties. Even here though, progress in understanding the factors responsible for dwarfism is slow. The processes of growth and shoot elongation in plants are complex, involving many known and, as yet, unidentified features. In the case of some dwarfs though, deficiency of a particular plant hormone, gibberellic acid, has frequently been suggested as the culprit. A number of researchers have found that most dwarf mutants in peas, corn, watermelon, barley, and other crops respond to the application of one or more gibberellins (some 40 different gibberellins, composing a whole class of plant hormones, have been identified) by growing as well as the normal variety. One possible conclusion is that those dwarfs which respond to the application of gibberellic acid substances contain mutations which affect different steps in the synthesis of this hormone. Apparently, these plants are dwarfed because they lack the amount of gibberellic acid required for normal growth. In several other dwarf mutants which contained normal levels of gibberellic acid substances, it was found that the gibberellin was qualitatively different from that of the normal variety. Precisely how the gibberellins produce their effects is still unclear, but it seems obvious that a number of biochemical processes, including interaction with other hormones, are involved. While the leap from dwarfism in corn and wheat to dwarfism in forest trees may seem a long one, we should keep in mind that trees are only one type of specialized plant form. At the cellular and molecular level, growth processes in trees are not fundamentally different from those in other plants. It is likely then, that those factors responsible for dwarfism in trees are the same as those responsible for dwarfism in crop plants, although no one has yet taken the time to demonstrate this.

The Adaptive Significance of Dwarfism

Finally, we may ask whether dwarfism in trees is ever adaptive. One possible instance that may have occurred to many of you is that of extreme climates such as occur in alpine areas. At very high elevation, a combination of heavy snow packs, strong winds, and shallow, droughty soils simply does not permit trees to grow to a large size. The low, spreading krummholz* habit of growth is a common feature at the upper tree line in alpine areas of the world. In such extreme climates, selective pressures may favor the dwarf habit as one which avoids desiccating winds, snow and ice breakage, and the need to transport water up tall stems under dry, summer conditions. Jens Clausen has examined elfin-wood stands of mountain hemlock, lodgepole pine and whitebark pine in the Sierra Nevada Mountains and concluded that these dwarf forms are, in fact, ecological races which have evolved a dwarf habit in the face of strong environmental pressures, and are genetically different from their tree-like counterparts. In this case, the pressures imposed by an ex-

*(from the German *krumm* = bent, crooked; and *holz* = wood, tree)

tremely harsh climate apparently are strong enough to offset, perhaps even replace, the strong competition for light which is a major determinant of tree form in less rigorous climates.

We can speculate that there are perhaps other situations where dwarfism is also adaptive. The extreme climatic conditions characterizing arctic and desert regions make them likely candidates for sites conducive to the evolution of dwarf forms. The mat-forming willows of the arctic and the shrubby junipers and pinyon pines which occur on dry, open areas in much of the west no doubt owe their form to strong selective pressures for reduced size.

Conclusion

It is in some ways comforting to think that the mutation process is one method for guarding against all possible turns-of-events in the future. The stock room of variability in most tree species is still considerable and much of it, like dwarf mutations, may only be utilized for horticultural ends in the future. But we should realize that we do not know what the future holds, and the best possible strategy for facing the unknown may be to maintain the broadest possible genetic spectrum—in plants as well as in animals, including man. It may someday be learned that variety is more than just the spice of life—it may be life itself.

* * *

The reader may find the following books and journal articles of some interest in pursuing further the above topic:

Clausen, J. 1965. Population Studies of Alpine and Subalpine Races of Conifers and Willows in the California High Sierra Nevada. *Evolution* 19:56-68.

Galston, A. & P. J. Davies. 1970. *Control Mechanisms in Plant Development.* Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

Horn, H. 1971. *The Adaptive Geometry of Trees.* Princeton University Press, Princeton, New Jersey.

Monod, J. 1971. *Chance and Necessity.* (Engl. Translation, A. Weinhouse), Random House, Inc., New York.

Wilson, B. F. 1970. *The Growing Tree.* University of Massachusetts Press, Amherst, Mass.

Specimen of whitebark pine *(Pinus albicaulis)* at tree line (6,600 ft.) on south slopes of Mt. Adams, Skamania Co., Washington. Photo: B. O. Mulligan

TRY IT!! IT'S EASY!!

*BETTY and JIM CAPERCI**

Everyone has his favorite way of doing things. The method that works well for one person may not be the right way for another. A little bit of experimenting is the best way to come up with the right answer.

We have been experimenting for thirty years. Being rather lazy gardeners, we try to find the simplest and easiest way of doing things that still gives us good results. Years ago we learned that most of the dwarf conifers are quite easy to propagate from cuttings, with no expensive equipment required and a minimum of effort. The main ingredients needed are good cutting material; a hormone or rooting ingredient; a box, flat, cold frame, or bench in a cold house; some sharp sand and lots of patience!

As we have an unheated greenhouse, we use part of an open bench for our dwarf conifer cuttings. But a greenhouse is not necessary. Our first attempts were made in a box in the basement; then we graduated to a cold frame. The fun of trying to propagate cuttings should not be missed just because a greenhouse is not available. The cuttings might take a little longer to root, but what's the hurry?

Down to the nitty-gritty! A layer of pea-gravel should be placed in the bottom of the box and the container filled to about an inch of the top with coarse sand. A strong spray of water should be run through the sand until the water runs out fairly clear. This is to wash out any dirt and silt. Now the box is ready for the cuttings.

We like to take our dwarf conifer cuttings in February, but anytime after a good hard freeze is O.K. The best cuttings are taken from a side branch, low on the plant, and preferably from the sunny side. We never take a cutting from the tip end of the branch, or the top branches, if we can help it, because these are not inclined to branch as well for us after they are rooted. Cuttings from the lower, sunny side of the plant grow into more compact, well-shaped little conifers.

Cuttings are peeled off with a heel, rather than being cut off the parent plant. The "heel" is then trimmed with a sharp knife or scissors (I use scissors. There is less chance of trimming the fingers a little, too!). All needles or foliage from the bottom half of the cutting is trimmed off. (This makes it easier to dip the cutting into the rooting medium and to insert it into the sand.) The cutting is then dampened slightly, dipped into the rooting medium (our choice is Hormodin powder #3), and shaken gently to remove any excess powder. A little hole is poked in the sand, the cutting is inserted and the soil is pressed around it to hold it steady. When all the cuttings are "planted," they are watered with a medium-strong spray to settle the sand and firm them. And that is it!

Humidity is important for dwarf conifer cuttings, but too much is disastrous. They must be kept just barely on the damp side, but never wet, and lightly sprayed with water whenever the sand becomes almost, but not completely, dry. Some of the cuttings will root faster than others, so it is advisable to leave them undisturbed until early fall when they should be well rooted and ready to transplant.

This simple method has worked well for us for many years with almost 100% success for most of the dwarf conifers, although I must admit that our success has not been that good with *Cedrus*. Pines are also more difficult. Results with spruces, *Chamaecyparis, Tsuga*, etc., have been most satisfactory.

Dwarf conifers of all kinds are in great demand today for the smaller yards, rock-gardens, rockeries, window-boxes, and bonsai. There are so many places where this type of plant can be used. They are tremendously hardy and easy to care for. They take many adverse conditions in the garden. They make excellent potted plants.

Success in growing a few cuttings of the dwarf conifers gives one a feeling of pride and satisfaction that "I did it myself!" Try it! It's easier than you think!

---

*Mr. and Mrs. Caperci are owners of a small nursery dealing primarily with dwarf rhododendrons and conifers.

Dwarf Conifers in the Arboretum, Washington Park

BRIAN O. MULLIGAN

Plant of *Juniperus communis* 'Compressa' on wall behind east greenhouse, Arboretum, Seattle. Height 44 ins.; width 11 ins.

Since the early days of the Arboretum, dwarf conifers have been gathered together by donation or purchase from many sources, and are consequently to be found in a number of varied situations between the Madison Street entrace at the south and the area around the offices and greenhouses at the north end.

Coming in from Madison Street the bank on the right is now almost covered by junipers of varying color and habit, mostly gray and spreading, providing some contrast in the winter months. Between these and the stone cottage are several groups of older (1939) plants: two dwarf forms of the Norway spruce *(Picea abies)*, 'Pygmaea,' and one at present unidentified; and four bushy specimens of the Japanese *Cryptomeria japonica* 'Nana,' still no more than four feet in height after 35 years of growth.

At the junction of Lake Washington Blvd. E. and Arboretum Drive, some interesting plants are to be seen on and around the rock garden, besides the many junipers which enjoy this sunny situation. On the right, just inside the gate, is a single plant of the one-leaved pinyon pine, only six feet in height although planted in 1957. Close to it are examples of the attractive gray and golden-leaved forms of the Chinese juniper, *Juniperus chinensis* 'Blaauw' and 'Plumosa Aurea,' which in time, however, may reach ten to twelve feet in height.

On the west side of Arboretum Drive are two notable four foot specimens of the very dwarf and compact form of *Cryptomeria* named 'Vilmoriniana,' propagated here from cuttings in 1947 and planted out in 1953. This form was originally imported from Japan to France about 1890. Beside them is a narrow, conical small tree about eleven feet in height originally received in 1938 as *Cedrus libani* 'Nana,' but which seems from its habit of growth more likely to be the cultivar known as 'Comte de Dijon.' This was planted in 1957.

A little farther north and up the bank are two plants of a dwarf form of the eastern white pine, *Pinus strobus*, received as 'Nana' in 1956 from a nursery in Oregon and planted the following year. Their proper name is still uncertain, but they make an attractive pair, now eight feet and twelve feet tall. At least one has borne cones.

By parking at the entrance to the service road here some other species can be seen. Beside the cable gate are two healthy plants of *Pinus mugo*, native of central Europe. At the top of this bank, behind some bushy

tanbark oaks *(Lithocarpus densiflorus)* is a flourishing plant of *Podocarpus nivalis*, a subalpine shrub from both islands of New Zealand growing more or less prostrate on the ground. It is probably the hardiest of this genus. Planted in 1961 it is now about five feet in width. Beside it is an example of one of the smallest, most compact forms of Port Orford cedar, *Chamaecyparis lawsoniana* 'Minima Glauca,' planted in 1953 and still only three and one-half feet in height.

Proceeding up the Boulevard and parking just north of the Japanese Garden there is a variety of small conifers to be seen on the rocky bank at the south end of Azalea Way, surmounted by a group of mountain hemlocks *(Tsuga mertensiana)*. Here are two more of a dwarf form of *Pinus strobus*, received as "Umbraculifera' in 1959 and planted in March 1967. One of these, now eight feet tall, has produced cones, but in habit they do not in the least resemble 'Umbraculifera' as illustrated in Murray Hornibrook's book, *Dwarf and Slow Growing Conifers*, 2nd ed. (1938). Their true identity requires further research and information from other sources.

Two prominent plants here by reason of their bushy habit and purplish hue in winter are *Thuja orientalis* 'Juniperoides,' planted May 1969 and now four-five feet in height. Because of their soft juvenile foliage and rather loose habit they are apt to be opened up by snow, so should be given a sheltered situation if possible. Close beside them are three small plants of the extraordinary form of the eastern Arbor-vitae *(Thuja occidentalis)* named 'Ohlendorffii,' compact and bushy in form but producing both juvenile and adult foliage on the same branch and throwing up longer whip-like branches from the top of the plant. The wide spreading fir on this bank is a form of the Fraser firm from the Appalachian Mountains, *Abies fraseri* 'Prostrata,' but it is far from being prostrate, perhaps partly owing to the influence of the stock upon which it is grafted.

A fourth area of interest to students of these plants are the two low beds above the stone walls behind the greenhouse. These contain some large old specimens and some younger, of considerable variation in size, form and coloring. Among the former are two fine plants of the dwarf Alberta spruce *(Picea glauca* 'Conica'*)* planted 1948-50, now nine-

Dwarf conifers on wall behind greenhouse, Arboretum, Seattle. (L to r) *Calocedrus decurrens* 'Intricata', planted 1968, height 41 ins.; *Chamaecyparis lawsoniana* 'Nana', 85 ins. tall, 90 ins. wide, and c.l. 'Minima', height 55 ins.; width 70 ins. Photo: B. O. Mulligan

***Tsuga canadensis* 'Cole's Prostrate', on wall behind west greenhouse, Arboretum, Seattle. Height 27 ins.; width 52 ins. Photo: B. O. Mulligan**

ten feet in height and five-six feet in width; two *Chamaecyparis lawsoniana* 'Nana,' planted at the same time but now only six feet in height, six-eight feet wide. The form 'Minima' on the west wall is smaller with a flatter top instead of being conical and is now about five feet by six feet, having been planted in 1948. These are most satisfactory trouble-free plants where space is available.

Among the young specimens on the east wall are the upright, very compact juniper, *J. communis* 'Compressa' (or perhaps 'Columnaris,' which is taller), three and one-half feet in height after ten years' growth; two dwarf firs, *Abies balsamea* 'Hudsonia,' originally found in the mountains of New Hampshire, making a small cushion some twenty-one inches high and forty inches wide in ten years. *A. concolor* 'Husky Pup,' a seedling which appeared among others in a garden in Bothell, Washington, was given to the Arboretum and named here by J. A. Witt; its size now is twenty-one inches by thirty-six inches. *Chamaecyparis obtusa* 'Mariesii' is an unusual form of this Japanese false cypress with variegated branches and foliage which in six years has grown from eighteen inches to four and one-half feet in height. Behind it is another *Podocarpus* from New Zealand, *P. hallii*, undamaged by recent winters and now four feet in width.

On the west wall there is a dwarf form of the incense cedar *(Calocedrus*, or *Libocedrus, decurrens)* from Oregon and California named 'Intricata,' now forty inches tall and fifty-two inches wide after six years' growth. At the end of it is a flourishing specimen of the creeping eastern hemlock, *Tsuga canadensis* 'Cole's Prostrate,' a delightful plant for any garden in this region. It is now fity-two inches wide but only twenty-seven inches in height.

A new planting of other forms of these fascinating small evergreens has been made since 1968 to the west of Azalea Way south of the oak collection, but it is too early yet to report on their progress, although most seem to be thriving in this more shady location.

In foreground, *Abies concolor* 'Husky Pup', height 21 ins.; width 36 ins. In background, *A. balsamea* 'Nana', 21 ins. high, 39 ins. wide. Arboretum, Seattle. Photo: B. O. Mulligan

Aerial view looking south over Union Bay and landfill area proposed for site of new Arboretum development. Photo: Grant W. Sharpe.

Note: Aerial view and Preliminary Concept Plan on next page are 180° out of alignment.

The Proposed Union Bay Arboretum

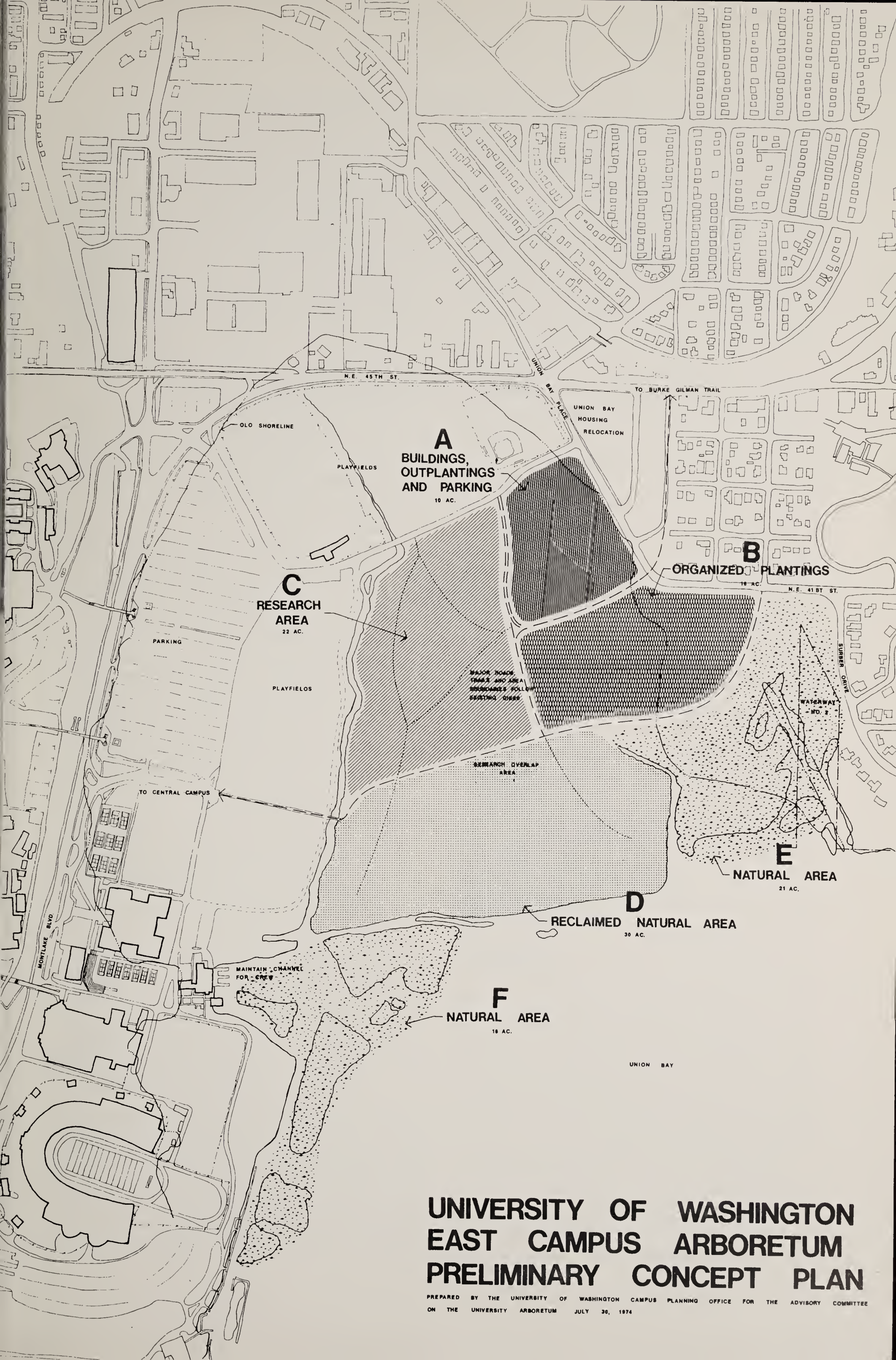
J. A. Witt

A parcel of land belonging to the University of Washington on the eastside of Montlake Blvd. and south of N.E. 45th St. has had a varied history. Prior to the opening of the Hiram Chittenden ship canal and locks in 1915 it was a shallow embayment and estuary of Ravenna Creek on Union Bay of Lake Washington. The level of the lake was lowered when the ship canal opened, and this area became a marsh with a luxuriant stand of cattails growing over a substrata of peat that varied between 10 and 120 feet deep.

A land-fill project began on the marsh about 1930, and for about the next thirty-five years it was used as a dump for both garbage and rubbish until nearly all of the area was raised well above lake level. That portion of the fill which was the oldest, the section along Montlake Blvd., was made into intramural playfields and parking lots, and the northern section was developed into a golf driving range, baseball field and corporation yards (storage sites for construction equipment and materials). The higher ground to the east was developed into married student housing shortly after World War II and is currently being used for this purpose, although one group of houses near N.E. 45th was removed several years ago.

Altogether there are ninety-odd acres of open, slightly rolling land occupied only by Union Bay village, the student housing in one corner; the corporation yards a few hundred yards away to the northwest, and on the western edge by a fairly sizable parking lot.

(continued on p. 12)



UNIVERSITY OF WASHINGTON EAST CAMPUS ARBORETUM PRELIMINARY CONCEPT PLAN

PREPARED BY THE UNIVERSITY OF WASHINGTON CAMPUS PLANNING OFFICE FOR THE ADVISORY COMMITTEE ON THE UNIVERSITY ARBORETUM JULY 30, 1974

It is this property which we hope to develop into an arboretum that will complement the existing Arboretum in Washington Park. Examination of the accompanying map will show that there are still some sizable wetlands on the east and in the southwest corner and approximately 1,000 feet of shoreline on Union Bay. The western boundary is what was once Ravenna Creek, sluggish but attractive nevertheless with water plants and alive with birds.

Why should the University even be considering the development of the East Campus area into an Arboretum when it already has a well established and viable one in Washington Park? The answer of course, lies in the immediate past events so well-known to *Bulletin* readers. When it became evident that the University's plans for expanding its arboretum program could not be accommodated in Washington Park, the University Advisory Committee on Arboreta, consisting of faculty and staff concerned with the Arboretum's problems, considered a suggestion from Dean James Bethel that the Union Bay fill might be developed for arboretum purposes. There were several plusses for this site: first, it belonged to the University; second, it had been considered for the location of an all-University greenhouse complex, and third, the nature of the fill made it unsuitable for any major construction that might be planned by an expanding University. The Committee then produced preliminary conceptual plans of how the area could best be developed into an Arboretum primarily for research and teaching.

These plans have not been developed much beyond very preliminary concepts for the Union Bay site, but in general they are that the area will be divided into five sections: (A) Buildings and outplantings—16 acres; (B) Organized plantings—16 acres; (C) Research area—22 acres; (D) Reclaimed or managed natural area—30 acres; and (E & F) Natural areas—31 acres.

Tentatively, the thinking about each section is as follows:

A. Buildings and outplantings
   Here will be the Administration building, greenhouses and their auxiliary planting areas. The building will contain offices for staff and research personnel, laboratories, class and meeting rooms, probably office space for lay organizations, the library, the herbarium and the usual supporting rooms. The greenhouse will be for the propagation now done in Washington Park and will have research facilities as well. The outplantings will include the usual nursery, lath houses and frames and in addition will be used for closely supervised field experiments.
B. Organized plantings
   This area is being thought of in the context of a botanical garden, perhaps a display garden for teaching purposes as well as for the public.
C. Research area
   Probably this section will contain the major collections of woody species. It is planned to have not only collections of various plants but also to have experiments on how to grow and what to grow under the poor soil conditions that prevail here. Studies on the effect of methane gas from the decaying garbage on tree roots, ways to improve the impoverished soil, and studies of a similar nature could be conducted in this area.
D. Reclaimed natural area
   This tract of land is now open grass, the habitat of a large number of birds, many of which, we are told, are rare or most unusual in urban situations. This area would remain as it is, possibly receiving an annual mowing to maintain its grassy character.
E. & F. Natural areas
   These marshes and peat islands will receive no care other than protection and will remain as the last relics of what was once an extensive wet-lands.

To date no hard nor fast lines have been drawn to delineate these areas, and the sizes given are very approximate. It is probable that there will be major changes between the early plans and what finally comes into being. The Northwest Ornamental Horticultural Society

(continued on p. 27)

Dwarf Conifer Collections

Among outstanding dwarf conifer collections open to the public are two at opposite ends of our nation: the Gotelli Collection at the United States National Arboretum in Washington, D. C. and the collection at Strybing Arboretum in San Francisco. Both collections were assembled by private individuals and subsequently given to the respective institution.

The Gotelli Collection of Dwarf and Slow Growing Conifers, considered by many to be one of the most outstanding of its kind in the world, was donated to the United States National Arboretum by William T. Gotelli in 1962. Mr. Gotelli, a building contractor with an unusual enthusiasm for collecting, assembled most of the dwarf conifers over a period of fifteen years from nurseries, estates, and botanical gardens in the United States, Canada, Japan, Australia and New Zealand.

This incomparable collection of about 1500 specimens representing 30 genera in numerous varieties of fir, cedar, false cypress *(Chamaecyparis)*, juniper, spruce, pine, *Cryptomeria*, yew, arborvitae, hemlock and miscellaneous additional genera is set in attractive plantings, mulched with crushed blue stone, and separated by grass areas which permit close inspection of individual plants. Display labels with the name of the specimens increases the interest and educational value of the collection.

Diligent behavioral observations of the collection over the past few years have provided much needed information for making recommendations as to which additional cultivars are worth introducing to the nursery trade. The collection also serves to focus attention to research essential to resolving some of the complex taxonomic and nomenclatural problems that have plagued dwarf conifer enthusiasts for many years.

These unusual dwarf conifers, occupying an attractive hillside site of about five acres in the northeastern section of the Arboretum, well illustrate the infinite variation of form and color which is to be found in nature.

Another outstanding dwarf conifer collection is that assembled by James R. Noble of San Francisco in a life-time of collecting, and willed to the Strybing Arboretum. The collection includes over 175 taxa. Mr. Noble shared his interest and enthusiasm for dwarf conifers by his frequent contributions on the subject to the *Journal of the California Horticultural Society*. With their permission we reprint edited portions from "Climatic Dwarf Conifers" published in the *Journal*, April, 1953 (v 14; 2; pp. 73-80).

"When considering climatic dwarfs, one immediately thinks of trees growing along high elevations at timberline. Yet, in reality, any unusual conditions such as the presence of winds, differing temperatures, light and moisture or the lack of them, or different combinations of or exposure to the elements, can influence tree growth markedly. For this reason we have climatic dwarf conifers growing in many parts of the north temperate zone in North America, Europe, and Asia . . . in the hot and arid Southwest, in the far, frigid North, along the Atlantic and Pacific coastlines, in the North Central States, and in exposed situations in the Northern Appalachian Mountains, the Rocky Mountains, the Sierra Nevada, and the Cascade Mountains. These dwarfs must not be confused with such dwarfs as are due to poor soil conditions, as are the pygmy cypresses and other trees growing along the Mendocino Coast.

It would seem that most conifers do not need high altitude just for altitude's sake, but rather for what that altitude gives them—clear, clean air, coolness and rest periods. This is shown by the fact that many conifers, as they range northward, live at lower altitudes; also, that most of them can be successfully grown at sea level, as shown in the records of those grown in the British Isles.

We have, however, a complex problem when considering the advisability of moving these interesting small trees. The following questions arise:

First — What about the group from which they spring? Has it a broad range? Have some of its relatives prospered after moving? What

(continued on p. 26)

PORTRAITS OF

General view of Gotelli Dwarf Conifer Collection, U.S. National Arboretum, Washington, D.C. Ground cover and mulching materials are also displayed. Photo: National Arboretum

Dwarf form of *Pinus ponderosa* var. *scopulorum*, in Gotelli Collection at U.S. National Arboretum.

Cryptomeria japonica 'Globosa' at Gimborn Arboretum, Doorn, Holland.

Picea abies 'Echiniformis', 3 ft. high by 4 ft. wide at Arboretum Novy Dvur, Opava, Czechoslovakia.

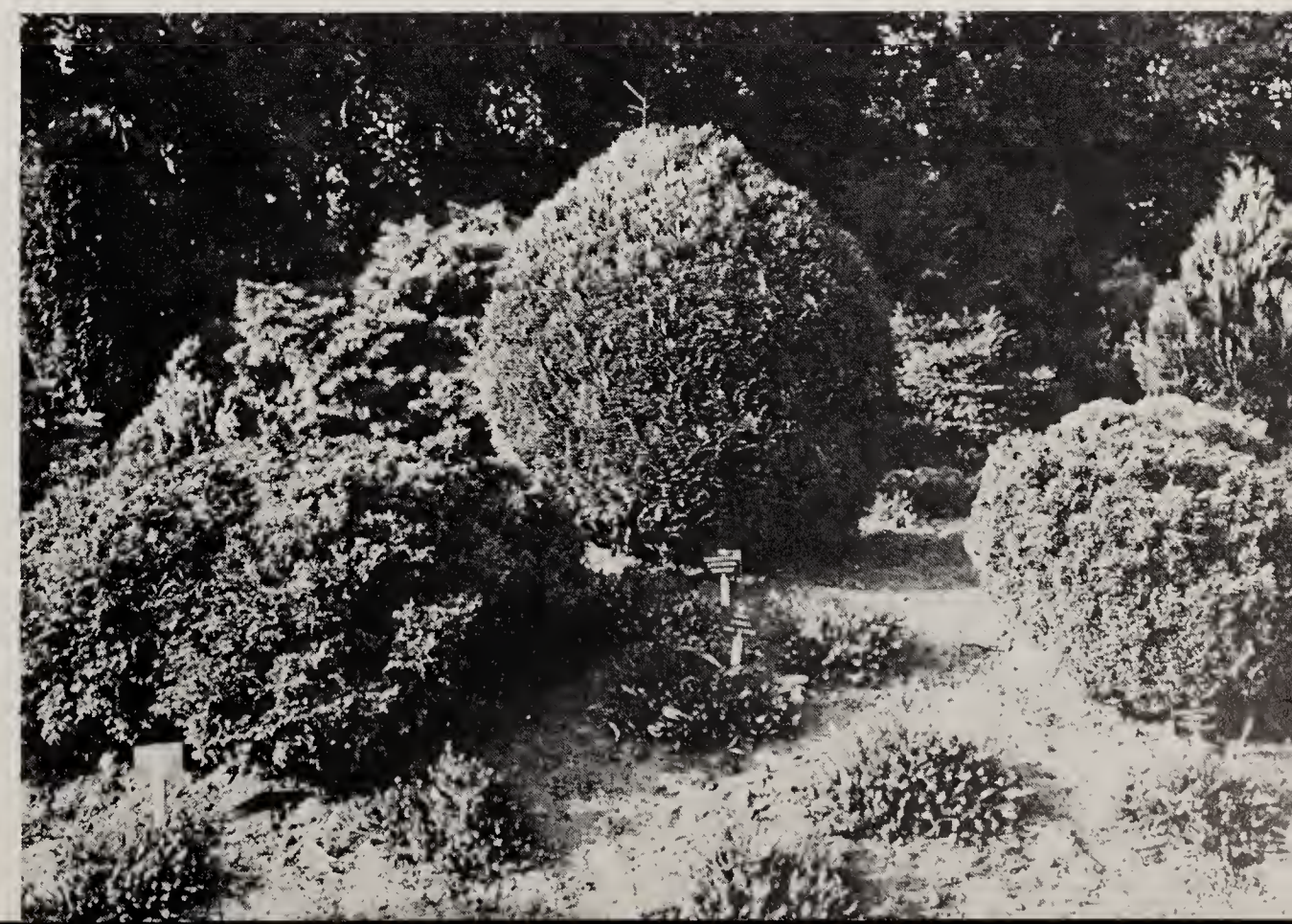
OME PYGMIES

Dwarf conifers and heathers at Savill Gardens, Windsor Great Park, England.

Cryptomeria japonica 'Pygmaea' in dwarf conifer collection at Strybing Arboretum, San Francisco. Height, 2 ft.; width 4½ ft.

Photos: B. O. Mulligan

Dwarf conifers and heathers at Royal Horticultural Society's Garden, Wisley, Surrey, England. In center, *Chamaceyparis lawsoniana* 'Gimbornii', 3 ft. tall.



University of Washington
Arboretum Classes — Summer, 1975

PRUNING ORNAMENTALS. Mr. Chico Narro, expert nurseryman, will demonstrate techniques for pruning trees and shrubs. Arboretum greenhouse; class limited to 30. Saturdays, March 22 and 29; 10-12 noon. 2 sessions, $5.

SPRING TOURS. Mr. Joseph A. Witt, Plant Curator of the Arboretum, will conduct tours of the Arboretum grounds in spring bloom. Class limited to 25; meet at Arboretum office. Saturdays, April 12, 26, May 3, 24, June 7; 10-12 noon. 5 sessions, $7.50.

NATURE PHOTOGRAPHY. Mr. Donald Riecks, Director of UW Audio-Visual Services, will discuss techniques for photographing plant material under various conditions. Class limited to 15; meet at Arboretum office. Saturdays, April 19, 26, May 3, 17; 10 a.m.-1 p.m. 4 sessions, $15.

HOUSE PLANTS. Mr. Richard van Klaveren, Arboretum propagator, will discuss indoor plants. Topics covered include houseplant identification, care, and techniques of propagation. Materials furnished. Arboretum greenhouse; class limited to 15. Thursdays, May 1, 8, 15, 22; 7-9:30 p.m. 4 sessions, $15.

SUMMER CUTTINGS. Mr. van Klaveren will teach seasonal techniques for propagating woody plants. Materials furnished. Arboretum greenhouse; class limited to 10. Thursdays, June 5 and 19; 7-9:30 p.m. 2 sessions, $10.

IDENTIFICATION OF NATIVE TREES AND SHRUBS. Mr. James Long, forest ecologist, will conduct this field class on identification. Over 40 species of common trees, shrubs, and ferns native to western Washington will be covered. Class limited to 15; meet at Arboretum office. Saturdays, May 10, 17, 24, 31; 10-12 noon. 4 sessions, $10.

To register, send check made payable to the University of Washington to:

Arboretum Courses
Anderson Hall AR-10
University of Washington
Seattle, WA 98195

For further information, call 543-2730.

This is your Arboretum, kept alive by your support

We are pleased to welcome the following new members (October 1, 1974 through December 31, 1974):

Contributing — Mr. & Mrs. Lyman Hull. *Sustaining* — Mrs. Thomas R. Conway, George Garmo. *Annual* — R. F. Andrews, Mrs. W. D. Arnott, Mrs. Stanley R. Adams, Mrs. W. E. Bailey, Mrs. W. B. Baldwin, Mrs. R. D. Bowser, Mrs. Joseph Cadden, Mr. & Mrs. Gary Carpenter, Mrs. Marvin Christman, Mrs. Richard Clark, Mrs. C. L. Constandinides, Mrs. Paul T. Cooper, Miss Marilyn Dalton, Mrs. Terrell Delaney, Ms. Lynn Detweiler, Mrs. J. A. Dougan, Mrs. Clifford Eckman, Mrs. Arthur D. Elliott, Mrs. J. S. Evans, Mrs. Roger J. Evans, Mrs. David Lane Ferguson, Mrs. Nita R. Fielding, David Fletcher, Mrs. Jeanette Fogelson, E. W. Fowble, Mrs. R. M. Fredell, Mrs. Rhoda Freier, Mrs. F. Jerry Gleeson, May Ellen Graham, Mr. & Mrs. Larry Green, Curt J. Hager, Peter M. Harvard, Mrs. C. Henry Heckendorn, Mrs. R. Wendell Hedges, Mr. & Mrs. William Jackson, Mrs. Carl J. Kludt, Mrs. Robert R. La Turner, Mrs. Robert H. Longnecker, Miss Pamela Luft, Miss Mary Jane McDonald, Mrs. Bruce Morgan, Mrs. R. D. Morrison, Mrs. Brandon Nielsen, Susan I. Noel, Mildred Oordt, Mrs. Winston H. Peterson, Mrs. R. A. Pickering, Mrs. Carl J. Pinard, Mrs. John Poinier, Mrs. Charles Ramey, Mrs. Albert Reed, Brad Reed, Faith M. Rice, Mrs. F. Pat Rogers, Mrs. Joel D. Roy, Mrs. Gary Sandstrom, Mrs. Jack E. Shepherd, Mrs. Thomas E. Sitterley, Mrs. S. Spoonamore, Mrs. William C. Stain, Mr. & Mrs. Robert W. Steele, Mrs. David Stimson, Mrs. John B. Sullivan, Mrs. William D. Trotter, Mrs. Lee T. Turnbull, Mrs. August Werner, Mrs. R. Willstadter, Mrs. Dean Wilson, Mrs. Glenn Woods, Mrs. Florence M. Wright.

We are also grateful to the following who have increased their dues to: *Sustaining* — Mrs. H. P. Clausing.

Edmonds Community College Courses

PLANT INSECTS (Horticulture 116; 4 credits). The identification and control of the common insect pests of horticultural plants.

PLANT DISEASES (Horticulture 128; 4 credits). Pathogens (bacterial, viral, fungal, nematodes) and environmental problems of plants will be identified; hosts and controls will also be discussed.

SPRING PLANT IDENTIFICATION (Horticulture 108; 6 credits). Deciduous trees and shrubs, annuals and bulbs of ornamental use in the northwest will be identified as well as their landscape placement and value.

For further information on these or other courses in the program, please contact the Horticulture Department at Edmonds Community College — 775-3511.

PHYLLIS PURDY BALLARD

Over a period of some thirty years, Phyllis Ballard (Mrs. Carl McNeilan) was one of the Arboretum's most loyal and enthusiastic supporters. A native daughter, she was born in Bellingham and moved to Seattle when she married the late Carl Ballard who shared her interest in the University of Washington Arboretum. Together they worked for its development, Mr. Ballard having served as President of the Arboretum Foundation.

The scope of Phyllis Ballard's Arboretum activities was boundless. She was elected to the Board of Directors in 1938 becoming an honorary member in 1966. With a small group of forward-looking members she was instrumental in forming the units, speaking in other cities of the state as well as within this city. Due in measure to the vigorous efforts of Mrs. Ballard and her co-workers, the Unit Council grew apace, now numbering seventy-eight active units. For many years she was adviser to the Unit Council and one unit was named in her honor.

Her keen interest in gardening had its first impetus in her own garden. Those who remember the lovely Ballard garden in Denny Blaine will recall tall conifers in the background and a high laurel hedge. Within this enclave was a unique collection of native broad leaved evergreens, choice rhododendrons and azaleas. There was a planting of the hellebores, including her favorite, *Helleborus niger*, or the Christmas Rose. An excellent article was written by her on this subject for the *Garden Club of American Bulletin*.

Many study groups came to the Ballard garden to learn the fundamentals of garden culture. In recognition of her horticultural skill, the late Andre Ostbo named one of his rhododendron hybrids *R.* 'Phyllis Ballard.' It was given a place of prominence in the garden. Mrs. Ballard served as President of the Seattle Garden Club and was awarded the Club's bronze medal for her numerous achievements.

In spite of well deserved recognition from many sources, she was innately modest, retaining a rare simplicity that was part of her charm. Any gathering was enlivened by the outreach of her warm personality. She possessed a rare enthusiasm seldom encountered in this work-a-day world. To be her friend was a mark of signal recognition and she is greatly missed by a host of friends. Phyllis Ballard had a truly magic way with growing plants, expressed in these words:

> They at her coming upward ran
> And touched by her fair fingers
> Gladlier grew.

ROSAMOND P. ENGLE

RUTH DOWELL SVIHLA

Members of Sylvia Henry Unit 15 of the Arboretum Foundation sadly note the death of Ruth Svihla on August 13, 1974. She was a founding member of the Unit, and took an active part in it for more than twenty-five years.

Ruth Dowell Svihla came to Seattle in 1938 when her husband, Dr. Arthur Svihla joined the University of Washington Faculty as a professor of zoology. A native of Rhode Island, she graduated from Smith College in 1920, received her MS in Botany from the University of Illinois in 1923, and a doctorate in zoology in 1930 from the University of Michigan. She became a Research Associate in botany and zoology at the University of Washington, as well as taking part in garden activities through the Faculty Wives Garden Club and the Arboretum Foundation.

The Svihlas traveled extensively following Arthur's early retirement from the University. Their many journeys to far away places included periods of some length as Fulbright scholars in Burma, where Ruth made an extensive orchid collection which she presented to the University of Rangoon.

In recent years the Svihlas lived on Camano Island, surrounded by some seventy-eight acres of lush greenery containing, in addition to fruits, flowers, vegetables, and bee hives, cattle and the horses they bred, trained and raced. It was a hobby Ruth especially enjoyed.

An interest in proteas growing out of seeing them in their native forms in South Africa resulted in an article published in the Winter 1971 issue of the *Arboretum Bulletin*. It was the last of her many publications.

These few words do not take adequate note of Ruth Svihla herself—her warm, friendly, sympathetic approach, showing helpfulness and concern; her wit and her enjoyment of a humorous situation, man made or in nature—her modest confirmation of proper scientific nomenclature of identification—her generous sharing of the many choice growing things the Svihlas cultivated —many qualities which greatly endeared Ruth to those fortunate enough to claim her as a friend over the years.

RUTH H. GERSHEVSKY

SOME OF OUR FAVORITES
Won't You Send Us Yours?

Hamamelis mollis

When you are asked to name a favorite plant or shrub or tree in your garden, can you immediately say, "It is this one or it is that one?" I am so interested in most of mine that I have a hard time choosing; however, at this time of year (January-February) there is one that I surely enjoy and admire. *Hamamelis mollis* or Chinese Witch Hazel must surely get an award for being one of the first in the new year for early bloom.

When the last of December or the first of January arrives this lovely things bursts forth with delightful yellow spidery balls of fluff, clinging tightly all up and down its brown branches, where the leaves will appear later. The blossoms are most effective against a grey or red brick wall; however mine happens to be against a blue-grey house, which makes an equally colorful note. The fragrance is so inviting and come ice or snow this reasonably hardy shrub-tree braves the elements to brighten a winter garden for all to see.

The growth is slow, and the tree can reach thirty feet with a spread of fiteen feet. The coarse serrated wooly leaves, three to six inches long, turn yellow in the Fall. It can be contained as a shrub with careful pruning for a time. If tree culture is your bent it should have a place to grow where it will have room. The Witch Hazel needs no special culture in this climate—good drainage and good garden soil. Try one in your outer border or in a corner that needs a bit of fall color.

ELIZABETH MARSHALL
Arboretum Foundation member

Arboretum Spotlight

Camellia reticulata

Of the many beautiful plants to be seen in the Arboretum throughout the year this camellia is certainly to be included among those of the highest quality, the more so since it is in the habit of flowering in February or March when there is less competition than later in the spring.

Planted about 1962 against the west end of the service building north of the offices, it is now approximately ten feet in height, while another of the same age trained against the east end of one of the lath houses covers a space of about fifty square feet. Both now flower freely each year, the latter, however, always two to three weeks later than the former.

The flowers are produced from rounded buds formed near the ends of short, stout branches; they open, as the photograph shows, to bowl-shaped blooms four inches wide when fully developed, of a glowing rose-pink color most conspicuous and welcome at that early time of the year. Furthermore they are solid enough to withstand some rain or frost, although it would be wise to pick some as soon as they show color in the bud and bring them indoors to enjoy their beauty unharmed. Plants will probably bloom for three or four weeks if the weather is cool as it usually is at that season.

The leaves are quite different and distinct from those of *C. japonica*, being dull dark green instead of glossy on the upper surface, the underside lighter green, shining, generally four-five inches long by one and three-quarters-two and one-quarter wide, the apex acuminate, base tapering to a stalk about one-half inch long, margin serrate, both sides having a prominent network of veins, impressed above and raised beneath, from which derives the specific name given by John Lindley in 1827 to the semi-double form which was first introduced from China.

The two plants mentioned were raised here from seeds received from the late Donald Stryker of Langlois, Oregon, in October 1957. He had originally acquired the species from a garden in Cornwall, England, and grown it in a cool greenhouse, not being sure of its hardiness. In March 1954, he had sent us a cutting which was successfully rooted and is now a healthy specimen eight feet tall growing in the Williams' Memorial camellia garden, protected overhead by a Douglas fir. Another of his seedlings planted in the center bed of the main camellia collection, with similar overhead protection, is now nine feet high and bearing buds, so that this species is reasonably hardy here if given some shelter.

The plant is native on the mountains around Tengyueh, Yunnan, in southwest China, at an elevation of 5,900-8,900 feet. It was first collected by George Forrest in 1912 and 1913, again by him and then successfully introduced by seeds in 1924 and 1925. The first flowering was at Caerhays Castle in Cornwall, by Mr. J. C. Williams, March 1932. It is very probable that Mr. Stryker obtained his seeds from this source. This, incidentally, is the easiest way to propagate this handsome camellia, which we have accomplished at the Arboretum. Seedlings will flower when about five or six feet tall.

BRIAN O. MULLIGAN

The University of Washington Arboretum represents a very unique and important resource for the Pacific Northwest. I am including here the Canadian segment of the Pacific Northwest, as well. We should reflect on how important the Arboretum is and how our understanding of the woody species in this particular area has been promoted and improved by the activities of this organization.

Proceedings: "The Urban Arboretum in a Time of Crisis"
Dr. Roy L. Taylor, Director
Botanical Garden, University of British Columbia

The Shotgun Approach to Hybridizing

*GWEN BELL**

Last year, 1972, Marty and I discussed the hybridizing of rhododendrons from an academic standpoint, talking about numbers of chromosomes, reluctance of elepidotes to cross with lepidotes, apomixis and selfing. Today, Elsie and I are going to let you in on the results of our own personal experiments, good and bad. I wish it were blooming season so that you could see the flowers, but the leaves and small plants that we brought may tell you something about these new rhododenrons. Some of mine are pretty funny!

My interest in rhododendrons was aroused when I saw the showiest, biggest and gaudiest trusses in a Rhododendron Show. I joined the American Rhododendron Society. I didn't attend meetings for a few years, but continued learning some of the hybrid names, sizes and colors while browsing in nurseries. Stories read in the ARS *Bulletins* led to a rising curiousity about the species. It is fun to search out special forms of these species,since they vary considerably, much as an antique collector pursues old and unusual things. Later, the characters of species and hybrids became important in determining what genes were available to play the gambling game of hybridizing.

We humans are full of curiousity and we are often an impatient lot, so that we dream of making the perfect rhododendron. We run outside and cross every flower that is blooming—this is the shotgun approach! In 1965, when I ran outside and crossed whatever was blooming, my only objective was to discover if a beginner could make a controlled cross. Introducing new marvels or improving rhododenrons was not on my mind at the time. *R.* 'CIS' was in full bloom and Lem's *R.* 'Jingle Bells' was just going over. Following directions, I placed pollen from *R.* 'Jingle Bells' on the stigma of *R.* 'CIS,' and in 1966, planted the seeds. *R.* 'CIS,' the seed parent, is ('Loder's White' x 'Fabia') so there were genes of *Rs dichroanthum, griersonianum, arboreum album* and more *griersonianum. R.*'Jingle Bells' combines genes of ('Ole Olson' x 'Fabia'). Here, we have more *R. dischroanthum* and *R. griersonianum* genes, some *R. campylocarpum* and *R. discolor* — quite a mixture. About twenty plants of this cross survived; most have bloomed. Several of them have been a good red color, bell-shaped with eight florets to the truss. Two of them produced trumpet-shaped florets opening brick red, then changing slowly to cream or pale yellow.This group started flowering when quite young, but are not really very attractive. One plant has salmon, almost orange, good-textured florets and one is yellow with a large calyx. The best flower of the lot is a yellow and pink blend with a yellow and pink calyx. *R. griersonianum* shows up in the red color and in the shape of the florets. *R. dichroanthum* lends it's calyx and *R. campylocarpum*, it's yellow genes. Most of these trusses have long, long stems, or pedicels, so that they droop like a hanging chandelier. Foliage on all these plants is medium green colored,smooth and glossy. Among their faults are the drooping trusses, the too-long pedicels and their attractiveness to slugs and weevils. Only the salmon-colored and the primrose yellow and pink hybrids are worth keeping, so far. I do think that they reflect a definite hybridization between my two haphazard parents, *R.* 'CIS' and *R.* 'Jingle Bells,' and I do think that knowing what I know now, I would not make this cross again!

That same year, 1956, pollen of *R.* 'Moonstone' was put on *R.* 'China.' Gene parents here are *Rs. fortunei, wightii, campylocarpum* and *williamsianum.* This cross produced very uniform plants. In 1970,

*Mrs. Bell, a member of the Unit Council's Rhododendron Study Group, concludes her discussion of rhododendron hybridizing.

when the first of them bloomed, there were six of them in a row. Each of them was low, slow growing with attractive smooth foliage. Most of them had bronzy new growth and the leaves resembled *R.* 'Moonstone.' Two of the seedlings had blue-green leaves and one leaf was indifferent, unfolding a longer, tapered, dull green kind of foliage with the veining of *R.* 'China.' The first plant of this cross to bloom had seven light pink florets with a small,red eye, like *R.* 'China.' The second seedling was such an ordinary pink that it was thrown out the next year. Much to my regret, I threw out number three, also. It had blue-green foliage and surprised me with it's pale yellow flowers. At the time, I was disappointed that it was not a stronger hue; now I realize that it did have the yellow genes and should have been hybridized further. Two of these plants have yet to bloom and one of the two has those glossy blue-green leaves (might it be a yellow?), while the other pleases me the most with it's veined, tapered leaf and it's low spreading habit. *R. williamsianum* obviously dominated this cross. Hopefully, the best plant will have the best flower. Lionel de Rothschild and William Whitney, hybridists, have been quoted as saying that the best rhododendrons are often the last in a seedling batch to bloom. *R.* 'Crest' flowered after Mr. de Rothschild had died and long after other siblings had been named.

Most of you remember the story of the *R.* Loderi group and that this outstanding hybrid resulted when two superior species were used as parents, My form of *R.* Moonstone was very poor. I had procured my plant from Jim Caperci; he had purchased his stock plant from the Greig's on Vancouver Island. Later, Jim told me that he had destroyed that *R.* Moonstone when he discovered that it was not a good clone. I had already destroyed mine after comparing with other *R.* Moonstone plants. It seems reasonable that a better form of *R.* Moonstone would have given me better seedlings.

A small group of ladies visited the garden of Founta Butler. She showed us two tall plants of rhododendrons with upright habit, then told us that it was a Lem cross of *R.* ('China' x 'Moonstone'). Our seed parents were the same clone, but our pollen parents, *R.* Moonstone, were different. Her plants were tall, upright with pale yellow trusses; mine were all low, spreading and generally pink flowered.

R. 'Lucky Strive' pollen was used on *R.* 'Dr. Ross', a Henny hybrid, and the seedlings all had long, narrow, dark green leaves. They showed strong *R.* griersonianum influence and they were very uniform. They were, also, unattractive. I allowed only two of them to bloom. Their blossoms were red and in no way, an improvement on their parents.

Conclusion: A beginner can make a valid cross, even if an unintelligent cross!

Last spring, the prettiest plant that I have raised was budded and I was anxious and excited. It was the result of a visit to Mr. Lem's nursery. He had given me a truss of *R.* 'Anna #4'. No pollen was apparent when I left the nursery, but as I drove home in an exceedingly hot car, I noticed that pollen was cascading out the florets on that truss. *R.* 'Anna' is not generally believed to emit much pollen, but with heat, this clone did. At home, *R.* 'Letty Edwards' was in bloom, so she became the seed parent. All of the resulting seedlings unfurled beautiful, dark blue-green foliage of an interesting shape. Our winter was severe and only four of these plants survived. Surprisingly, the buds on one plant were fat and swelled into bloom next May. They opened out a pale lilac, fading to white. Thirteen florets made up the truss and their margins were crimped or ruffled. It is fragrant, yet, it is a disappointment in flower. It lacks quality. According to some experts, we should allow a new hybrid to bloom, at least, three times, so that I will let the seedling stay. Perhaps, I should say that *R.* 'Anna' is ('Normal Gill' x 'Jean Marie de Montague') and *R.* 'Letty Edwards' is *R. campylocarpum* x *fortunei*). Checking their ancesters, we can see that there is a strong strain of the tender *R. griffithianum* which imparts a pale color, some *R. fortunei* which might give white and pink color, and combined with *R. griffithianum*, endow the florets with a lovely fragrance.

Seedlings of several *R.* 'China' crosses have bloomed and all have been mediocre, most of them showing drooping trusses and seldom holding their leaves for more than one year. I threw out five of them last week.

I hope that I am more discriminating now; at least I enjoy researching the parentage of the plants. The seedlings that I have coming on showing the most promise are some *R.* 'Naomi' hybrids. *R.* 'Naomi' x 'Mrs. Horace Fogg' is budded for the first time. One *R.* yakusimanum hybrid is budded and a *R.* 'Bowbells' cross has beautiful foliage. The most interesting cross that I have made is *R.* 'Odee Wright' x 'Cameo', but it will be a few years yet before they flower.

Certain color genes are recessive, and so is indumentum. To produce indumentum in a first generation cross, both parents must have indumentum genes. I hybridized *R. yakusimanum* with *R.* 'Gill's Crimson' and checking them in their third year, they show almost no signs of indumentum.

Elsie has produced several "mules". I have had only one "mule" so far, from a *R.* 'Loderi' cross. This truss is tall, conical, holds many florets, is deep pink on the margins, white in the centers and has almost nonexistent stamen. "Mules" last a long time in the garden because they don't get pollenized like other rhododendrons. My "mule" ages to a dirty pink on those edges, and since it stays in bloom longer, it is a disaster!

Most of my experience, as one can tell, has been eliminating undesirables. Here are the six guides that I am endeavoring to use:

1. Restrained growth and size.
2. Good foliage and holds leaves more than one year.
3. Hardy for our area.
4. Good truss of clear colors.
5. An intangible — good plant characters.
6. Can be propagated.

It might be fun to backcross or self to produce an F2 generation. More than one generation may be necessary to meet the goals that one sets. Many flowers will not accept their own pollen, so that we must, frequently, use different plants of the same clone, or mate siblings. The only selfed seedling that I have growing is *R.* 'Penjerrick'.

In retrospect, I believe it is better to have a goal, some idea of a specific plant and flower characteristic that we wish to create. Study of the Stud Book is a help to prevent recrossing hybrids already made. Wouldn't it be fun to create a bright yellow counterpart of *R.* 'Blue Diamond' or the first clear orange-colored rhododendron with a tall compact truss.

There is conflict among hybridists about which parent, seed or pollen, influences a cross the most. It seems that the majority of breeders feel that the seed parents exert the greater dominance. Some suggest reciprocal crosses and some say that it doesn't matter. Mr. Frederick Street maintains that his best *R. yakusimanum* crosses resulted when he used "yak" as the pollen parent, rather than as a seed parent. He mentioned in his book, also, that the most promising seedlings were among the last of a group to bloom. Surveying my plants to date, I would have to conclude that the pollen parent has been dominant.

It's tough at first, but one must be critical when he is evaluating his own "babies". So many hybrids have "dropped out" over the years that were once considered great.

Recently, I read a statement by John Basford of Brodick, "My first reaction to the question what six crosses I would like to be made was that I would far rather list six hundred of the present hybrids that should be destroyed. Of course, they could be joined by quite a few forms of certain species that should have been on the bonfire long ago."

Is this a supercritical comment? Probably not, but can't we have a lot of fun trying to create a big-flowered yellow or a better plant than *R.* 'Crest', a perfect orange, a true blue, early bloomers or later bloomers, some georgeous dwarfs, or rhododendrons for my clay and your sand.

Maybe, it's the "mother" instinct! Happy Hybridizing!

"SEE YOU AT THE PLANT SALE!"

UNIT CONVERSATIONS

In the Spring Unit Council members' thoughts turn to thoughts of *Work and Fun Days!* This year, Thursday, April 30 is THE DAY! Then all friends of the Arboretum give a gift of TIME. They come in old clothes, bringing their garden tools and their lunch to help groom our Arboretum and to show they care.

It is fun as well as work. Creativity abounds as participants model original "crazy hats." Prizes are given for the most unique ones and for the unit putting in the most hours weeding.

Work areas are assigned under the direction of Joe Witt. Those desiring a particular area to weed should call Work and Fun Day Chairman Phyllis Morgan, 232-2551.

The Arboretum needs individuals as well as units. Come and bring your friends on THURSDAY, APRIL 10th. Remember to sign in at the office at 9:30 A.M.

Unit Council members are also busily engaged in preparation for the annual plant sale to be held this year May 1 and 2. One area in which all Foundation members can participate is in donating plants from their own gardens for the sale. Listed below are the names, addresses and telephone numbers of plant sale area deposit stations. Persons donating plants are requested to list all plants donated, to make sure donator's name and address is plainly listed, and to take the plants to the nearest deposit station. Donated plants will also be accepted at the Arboretum until April 29 and until 3:00 P.M. April 30th. All donations should be potted or balled and burlapped, and tagged (name of material and color).

AREA DEPOSIT STATIONS

BELLEVUE
Mrs. David Clarke — Sh 6-7706
16280 S.E. 24th Bellevue 98008

Cora Gardiner — 746-2997
203-140th Bellevue 98004

KIRKLAND-EASTSIDE
Mrs. Arthur Gardiner — 822-9704
7601 Champagne Pt. Road Kirkland

KITSAP-BAINBRIDGE
Mrs. Philip Keith — 842-5084
Rt. 4, Box 4866 Bainbridge Is., WA 98110

MERCER ISLAND
Mrs. David Wolter — 232-4790
4219 Shore Club Drive Mercer Island 98040

Mrs. Charles H. Wyble — 232-5696
8811 S.E. 56th Mercer Island 98040

NORMANDY PARK-BURIEN
Mrs. Geo. McDowell — 242-1065
1673 S.W. 176th Seattle 98166

NORTHWEST
Mrs. Ivan Settles — 365-5236
16722 Meridian Ave. North Seattle 98133

SOUTH KING COUNTY
Mrs. W. E. Williams — 854-4014
11610 S.E. 196th Renton

WEST SEATTLE
Mrs. Francis Bell — 932-6016
5242 37th S.W. Seattle 98126

The afternoon program for our March Unit Council meeting will be given by Mrs. Edith Schurr, foremost authority on heritage roses in the northwest. Mrs. Schurr is Chairman of the Old Garden Rose Committee for the American Rose Society. She helped to found the local Evergreen Rose Society who will consign one hundred of their very special miniature roses for us to sell at the Council meeting and the Plant Sale. Mrs. Schurr's knowledge comes first hand as she has over five hundred old fashioned roses in her own garden.

Several varieties of these very special heritage roses which our grandmothers used to grow will be available at the Unit Council Meeting on March 20th and at the annual Plant Sale May 1 and 2. Two old favorite Moss roses will be 'Alfred de Dalmas,' crisp blush pink and fragrant, and robust 'Gabriel Noyelle' with semi-double flowers in pink and cream tones. The beautiful hybrid musk 'Bishop Darlington' with coral buds opening to three-inch flowers in peaches and cream shades, and the apricot buds and creamy gold flowers of 'Buff Beauty' are examples of musks available. A special climber will be the ever-blooming 'Sparrieshoop' with three-inch soft, single pink blossoms.

We will have many unusual low growing polyanthas like 'The Fairy' with pink rosettes, bright red 'Happy' and 'Marytje Cazant' with waxy coral blooms. The ever popular 'Dainty Bess' will be available again as well as other floribundas like the hard-to-find 'Ivory Fashion' and 'Golden Fleece,' a richly perfumed, clear yellow rose with four-inch flowers.

Mark your calendar for March 20th and plan to come to learn more about these favorites, and prepare now for an area in your garden for a spot of color and fragrance for this summer and summers to come.

You are invited to a public lecture

HUMAN RESPONSE TO PLANTS: A MAN-ENVIRONMENT RELATIONSHIP TO PLANTS

by

CHARLES A. LEWIS, HORTICULTURIST, MORTON ARBORETUM, LISLE, ILL.

April 8, 1975 8:30 P.M.
Room 207 Architecture Hall
University of Washington campus
Admission Free
Co-sponsored by
College of Architecture and Urban Planning and Northwest Ornamental Horticultural Society

One of the nation's leading authorities on the role of plants in the urban setting, Mr. Charles A. Lewis, will give a public lecture April 8, 1975, at 8:30 p.m. in Architecture Hall on the University of Washington campus. Mr. Lewis, a graduate of the University of Maryland and Cornell University is now Horticulturist at the Morton Arboretum near Chicago. He became interested in the interaction of man and plants while working with the New York Housing Authority's annual Tenant Flower Garden Competition at which time he began his studies on the psychological and sociological interrelationship between man and plants. He is currently directing a long-range project on this subject for the American Horticultural Society.

IT'S TIME AGAIN!

DON YOUR HATS! PICK UP YOUR TOOLS!
COME HELP US WORK IN THE ARBORETUM!!!

THURSDAY,
APRIL 10, 9:30 A.M.

Please register at the
Foundation Office

Bring your lunch – Coffee furnished.

PRIZES – 12:30 P.M.

Book Reviews

BIZARRE PLANTS, Magical, Monstrous, Mythical, by William A. Emboden. MacMillan Publishing Co., Inc., New York, 1974. Pp. 1x + 214. $10.95.

To come upon this marvelous, picturesque, yet *responsible* work—especially after the recent spate of books that appeal to the irrational and the supernatural—is very refreshing indeed! The author is senior curator of botany at the Natural History Museum of Los Angeles, professor of biology at California State University, Northridge, and lecturer in ethnobotany at the University of California in Los Angeles; he also serves on the editorial board of *Terra*, his museum's magazine. In this richly illustrated tome, he manages to demonstrate, in a superb and seemingly effortless way, that one does not have to resort to half-truths, sly tricks and charlatanism to uncover the mysteries, the magic and the beauty of plants. He is equally well at home in Botany, Pharmacy, History and Mythology, evaluates the evidence critically but with a smile; tall tales are quoted in a wonderful tongue-in-cheek fashion, so that one is never seduced into taking the chaff for the grain. Significantly, Chapter 11, which has many amusing old woodcuts, is entitled: "Plants That Never Were." Other chapters deal with such things as carnivorous plants, monstrous plants (here, the author presents the huge flower of *Rafflesia*, the giant inflorescence of *Amorphophallus titanum*, the noble water-lily *Victoria regia*, etc.); Dragon's Blood (Chapter 5); Fungal Fantasies (Chapter 10); Mandragora (Chapter 8); Orchids in Witchcraft and Medicine; and so on, and so forth. But we don't want to spoil your fun by giving the story away—readers should dig in for themselves. A rare treat, thoroughly recommended!

B. J. D. MEEUSE,
DEPARTMENT OF BOTANY,
UNIVERSITY OF WASHINGTON

AZALEAS, by Fred C. Galle. Southern Living Books, P. O. Box 2463, Birmingham, Alabama 35202. 1974. (45 color illustrations, 31 black and white, 14 line drawings and hardiness zone map of U.S.), 96 pages, $6.95 plus 60¢ postage. (Available also in paperback with black and white illustrations, $1.95 plus 60¢ postage.)

Fred Galle is probably the best qualified person in the U. S. to write this book. Since 1953, he has been Director of Callaway Gardens, Pine Mountain, Georgia, where more than 600 varieties and over 40,000 azaleas are grown on 3,000 acres.

I must highly recommend the hard back edition, with color illustrations. Color printing is very expensive, and it is amazing that a book of this quality can be sold for this price.

There are chapters on Landscaping, Planting and Care, Special Azalea culture, Companion Plants, Propagation, Disease and Pests, Azalea or Rhododendron, Hybrid and Evergreen Rhododendrons, Recommended List of Evergreen, Deciduous Azaleas, with lavish color illustrations of many of the eastern natives, and a list of azalea gardens.

Azaleas, both evergreen and deciduous, are NOT the "poor man's rhododendron." They are aristocrats in a class by themselves, and often easier to grow and less demanding as to soil, sun and site than what we usually think of as rhododendrons, and worthy of much greater use than they are given here in western U.S.A.

To this resident of the Pacific Northwest the most valuable chapter in the book has to be the one dealing with the deciduous eastern species. These lovelies are virtually unknown on the west coast. Few nurseries, east or west, carry any of them, partly due to difficulty of propagation, and lack of demand by a largely ignorant public. True, they are difficult, but not impossible, to propagate from cuttings. The surest way to obtain these beauties is to grow them from seed, obtainable in recent years through the American Rhododenron Society Seed Exchange. It is a sad fact that here on the west coast we know far more about the Asiatic species, and isn't it ironic that we search the world over for ornamentals for our gardens, and overlook the goodies in our own backyard?

This is a beautiful book, long overdue, that no "rhododendron buff," from rank amateur to professional, will want to be without.

MAE GRANSTON

Publicity: Mrs. Rollie R. Roberts
24001 S.E. 238th St.
Maple Valley, WA 98038
432-9537

WHO: South King County Arboretum Foundation

WHAT: Annual Plant Sale

WHEN: Friday, April 25, 1975,
9:00 a.m. - 7:00 p.m.

WHERE: Kent West Mall
1331 West Meeker
Kent, WA 98031

Details: We will have for sale rhododendrons and azaleas (hybrids and species); trees; shrubs; ground covers; herbs; bonsai; perennials; natives; heather and much more.

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14548 S.E. 26th **BELLEVUE**

Conifer Collection *(continued from p. 13)*
about the group's adaptability?

Second — Can the plant be successfully moved? Large plants take years of preparation — two, three, or more, depending on age and size — for the final moving. Young, small plants, a foot or more in height, growing in rocky soil (which is where most alpines grow), require a careful and patient procedure. I have found that the following plan works very well. Map out a small circular area extending well beyond the branches. Then remove the rock and dirt from a small segment of the circular area as far down as fifteen or eighteen inches (more, if necessary), using the fingers gently and skillfully in handling the little feeder roots. When this process has been completed, fill in the hole with leaf mold and proceed with another segment, continuing the same operation until you have come full circle. By working each segment toward the spot directly below the point at which the stem leaves the ground, you will be able to lift the specimen from the hole. You will, in all probability, find it necessary to cut some small roots. Have already prepared a piece of burlap containing damp leaf mold. Lift the plant onto the burlap, gently place additional mold on top of the roots, and ball as promptly as possible. The secret is not to let the roots dry by contact with the air.

Third — What future exposure is the plant to have? The exposure of the new location is one of the most important problems. As illustration: if you take the pinyon pine from the dry, hot Southwest and place it in a northern exposure in the North, with more moisture than it ever had previously, the result would probably be disastrous for the tree. Reverse conditions would very likely be equally fatal to a specimen from a subalpine location with a northern exposure.

Fourth — Does soil play an important part? It does with some plants. Outside of our own western species the junipers, living as they do in a sandy or gravelly soil, seem to abhor heavy soil. Light sand and gravel or sandy loam are desirable. Firs of the west, prefer heavy soil and dislike sandy ground.

Fifth — Some measures should be taken to assure good drainage, similar to that of the mountain terrain from which most of these little plants come. There are exceptions, some of the piceas grow well around swamps.

Sixth — Do the plants require feeding and watering? If the ball containing the plant is placed in a hole twice as large as the ball and the hole is filled with leaf mold, that is all the feeding it normally should have. You are not after fast growth. Watering should be done weekly or bi-monthly the first year, and after that the plant should have as much moisture as it had in its former home.

Seventh — Is the plant likely to be troubled with pests, fungus, or disease? In its new home it will be subjected to a host of annoyances. It is necessary to watch it closely at short intervals for as long as three or four years, sometimes longer. Spraying at suitable times will control the pests.

Eighth — What about the possibility of the specimen's reverting to normal? Too many unpredictable factors might affect it. The plant is subject to the whim of the planter, and therefore any results are possible. But generally speaking it may be said that if the specimen has inherited some abnormal condition, which has been present since the beginning of its life, that abnormality should last throughout its lifetime."

A DWARF CONIFER BIBLIOGRAPHY

For those readers who wish to pursue the subject of dwarf conifers, Mr. Mulligan has prepared the following bibliography.

Dallimore, W. & Jackson, A. B. *A Handbook of Coniferae and Ginkgeae.* 4th Ed. Revised by S. G. Harrison. London, 1966.

Den Ouden, P. & Boon, B. K. *Manual of Cultivated Conifers.* The Hague, 1965.

Hornibrook, M. *Dwarf & Slow Growing Conifers.* 2nd Ed. London, 1966.

Krussmann, G. *Handbuch der Nadelgeholze.* Berlin and Hamburg. 1970-71.

Welch, H. J. *Dwarf Conifers.* London, 1966.

Dwarf Conifers. Plants & Gardens, Handbook 47. Brooklyn Botanic Garden, May, 1965.

Union Bay

(continued from p. 12)

has given $35,000.00 to be used for the planning phase of this project. The University Committee on Landscape Plantings and the University Architectural Commission have approved the preliminary concepts and the local firm of Jones and Jones, Landscape Architects, have been selected to prepare a master plan and environmental statement for the development. Plans are being made to relocate the student housing, Union Bay Village, since it now occupies the land planned for the organized planting area. This housing is substandard and will have to be replaced shortly whether the Arboretum development goes or not.

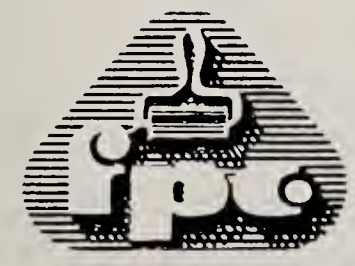
The Union Bay fill offers a real challenge to the designers and developers of an Arboretum there. The major physical problem is the wretched soil, hard packed and sterile over deep layers of decaying garbage. Wind also will pose problems until a shelter belt is developed.

Conversely, an arboretum has some great potential assets. There is a lovely sweeping view of Lake Washington toward Mt. Rainier. The unequal subsidence of the garbage has resulted in the development of a rolling terrain, with a surprising amount of relief for what was once a flat piece of ground. The marsh area on the east and the cattail and peat marsh land to the southwest make a pleasing frame for an institution devoted to the study of plants as well as offering research potential. The site will be near the campus within easy access for students and staff, which should make the Arboretum a closer part of the University community. And finally, it will be on land owned and controlled by the University, surely a step in the right direction after years of being in a sort of no man's land in Washington Park.

Lest there be concern that the University will gradually phase out its Washington Park commitments Dr. James S. Bethel, Dean of the College of Forest Resources, stated in an interview published in the *Seattle Times* October 13, 1974, "I guess my argument is that this (new plan) is the only feasible procedure that we've been able to come up with that insures we *won't* get out of Washington Park." He further pointed out that the addition of the Union Bay facilities would give the University of Washington Arboretum the total system, that is, Research, Teaching, Display and Public Service capabilities, that it has never had in the past.

The Union Bay area is worth a visit now to see the potential of this property for the development of an Arboretum. We suggest that you pick a dry day sometime soon, preferably when the skies are clear and Mt. Rainier is visible, dress warmly and we think you will agree that this is truly a magnificent site with great possiblities for an Arboretum.

One last comment—the Union Bay Arboretum should not be visualized as another Washington Park Arboretum. It never could be nor is it planned to be. It should be thought of rather as another type of development serving a different function, with the two properties complementing each other and serving the public in a way that neither could alone.



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COMING EVENTS CALENDAR

DATE	EVENT
March	
3	Rhododendron Study Group
5	House Plant Study Group — Day
5	Bulletin Editorial Board Meeting
6	Unit Council Board Meeting
11	House Plant Study Group — Night
13	Foundation Quarterly Board Meeting
17	Northwest Natives Study Group
19	Rock Garden Study Group
20	Unit Council Meeting — Mrs. Edith Schurr on "Heritage Roses"
24	Hitchcock Book Lecture #3
26	Arboretum Explorers
31	Final Hitchcock Book Lecture
April	
2	House Plant Study Group
2	Bulletin Editorial Board Meeting
3	Unit Council Board Meeting
7	Rhododendron Study Group
8	Charles A. Lewis, Morton Arboretum: Human Response to Plants
8	House Plant Study Group — Night
10	WORK AND FUN DAY
10	Foundation Executive Board Meeting
16	Rock Garden Study Group
21	Northwest Natives Study Group
23	Arboretum Explorers

LOOKING AHEAD

May	
1 & 2	UNIT COUNCIL PLANT SALE

REMEMBER

Every TUESDAY — Greenhouse Day; Every FRIDAY — Herbarium Committee; Every FOURTH WEDNESDAY — Arboretum Explorers

FOR INFORMATION, CALL 325-4510

THE ARBORETUM BULLETIN

Published by the
Arboretum Foundation
University of Washington Arboretum
Seattle, Washington 98195

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28th annual

PLANT SALE

university of washington arboretum

1 may 4-8 p.m.
2 may 10-4 p.m.